

Application No.09/341,339
Filed: August 30, 1999
TC Art Unit: 3723
Confirmation No.: 5010

AMENDMENT TO THE CLAIMS

1 - 6. (Canceled)

7. (Currently Amended) The electrolytic integrated polishing apparatus for polishing the internal surface of the cylindrical portion of an aluminum extrusion hollow shape by integrating elution by electrolyte and abrasion by a grindstone attached to a tool electrode inserted into an inside of the cylindrical portion, said apparatus comprising a work supporting unit for disposing the aluminum extrusion hollow shape so that an axial center of the cylindrical portion is aligned with a vertical direction, a rotation shaft supported downward along the vertical direction and inserted into the inside of the cylindrical portion of said aluminum extrusion hollow shape, a tool electrode attached to a tip of the rotation shaft, and a transportation unit for moving said rotation shaft and/or the work supporting unit along the axial direction; and

~~according to claim 4,~~ wherein a free ring mechanism is disposed at and axially aligned with one or more of an upper and lower openings of the cylindrical portion of the aluminum extrusion hollow shape, said free ring mechanism has a sleeve and

-13-

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a free ring supported free-rotatably within the sleeve, and has approximately the same bore as a finished bore of said cylindrical portion and has approximately the same length as that of an elastic grindstone, and is rotatable freely and synchronously by a pressing force of the elastic grindstone.

8. (Canceled)

9. (Currently Amended) ~~The~~ An electrolytic integrated polishing apparatus for polishing the internal surface of the cylindrical portion of an aluminum extrusion hollow shape, the internal surface having a length ten or more times greater than a diameter thereof, by integrating elution by electrolyte and abrasion by a grindstone attached to a tool electrode inserted into an inside of the cylindrical portion, said apparatus comprising a work supporting unit for disposing the aluminum extrusion hollow shape so that an axial center of the cylindrical portion is aligned with a vertical direction, a rotation shaft supported downward along the vertical direction and inserted into the inside of the cylindrical portion of said aluminum extrusion hollow shape, a tool electrode attached to a tip of the rotation shaft, and a

-14-

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transportation unit for moving said rotation shaft and/or the work
supporting unit along the axial direction; and

~~according to claim 4, further comprising a hollow portion~~
inside the tool electrode, and a pressure tube which can be
pressurized in said hollow portion.

10 - 14. (Canceled)

15. (Currently Amended) The apparatus for polishing the internal
surface of the cylindrical portion of an aluminum extrusion hollow
shape according to claim 7, further comprising a hollow portion
inside the tool electrode, and a pressure tube, which can be
pressurized, in said hollow portion.

16. (Canceled)

17. (Currently Amended) ~~An aluminum extrusion hollow shape~~
~~finished by the electrolyte integrated polishing apparatus for~~
polishing the internal surface of the cylindrical portion of an
aluminum extrusion hollow shape by integrating elution by
electrolyte and abrasion by a grindstone attached to a tool
electrode inserted into an inside of the cylindrical portion, said

-15-

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apparatus comprising a work supporting unit for disposing the aluminum extrusion hollow shape so that an axial center of the cylindrical portion is aligned with a vertical direction, a rotation shaft supported downward along the vertical direction and inserted into the inside of the cylindrical portion of said aluminum extrusion hollow shape, a tool electrode attached to a tip of the rotation shaft, and a transportation unit for moving said rotation shaft and/or the work supporting unit along the axial direction; and

method according to claim 4, wherein a length of a cylindrical portion thereof being is ten times as large as a diameter thereof, or more, and a roundness of an internal surface of the cylindrical portion equal to or smaller than 10 μ m and a surface roughness Rmax equal to or small than 1 μ m after polishing.